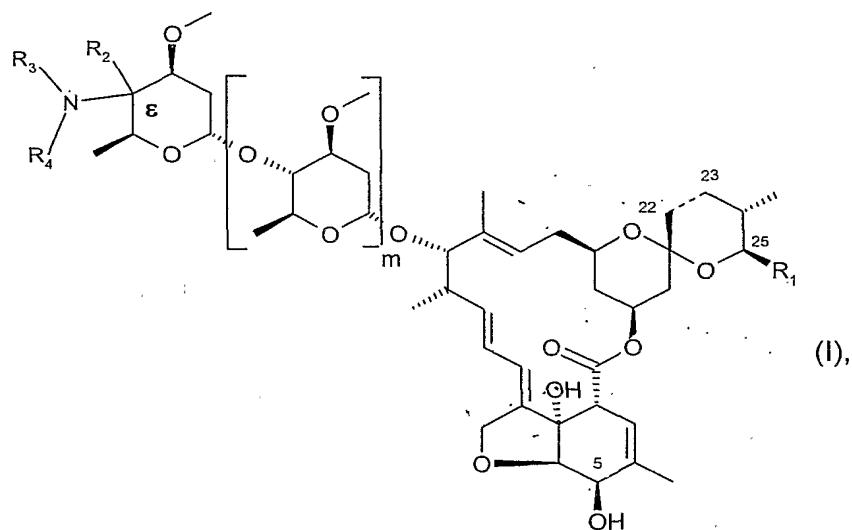


## CLAIMS

1. A compound of the formula (I)



5 wherein the bond between carbon atoms 22 and 23 indicated with a broken line is a single or double bond,

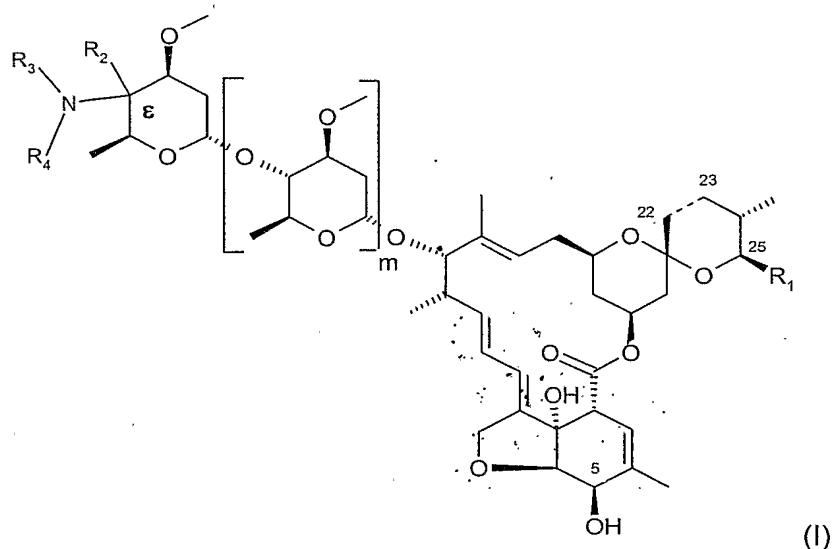
m is 0 or 1,

R<sub>1</sub> represents a C<sub>1</sub>-C<sub>12</sub>alkyl, C<sub>3</sub>-C<sub>8</sub>cycloalkyl or C<sub>2</sub>-C<sub>12</sub>alkenyl group,

R<sub>2</sub> represents a hydrocarbyl group or a substituted hydrocarbyl group, and

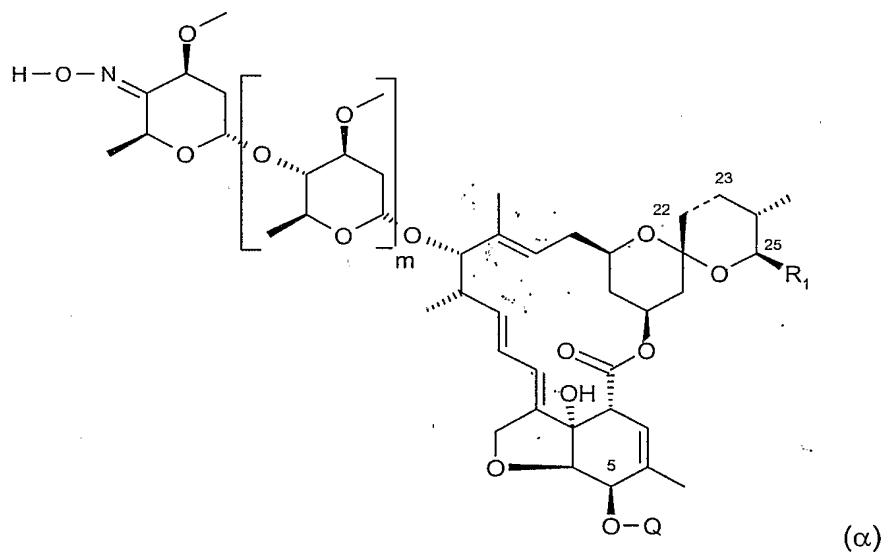
10 R<sub>3</sub> and R<sub>4</sub> represent, independently of each other, hydrogen or a chemical constituent, or either R<sub>2</sub> and R<sub>3</sub> together or R<sub>3</sub> and R<sub>4</sub> together represent a three- to seven-membered alkylene or a four- to seven-membered alkenylene bridge, for each of which at least one, preferably a CH<sub>2</sub> group may be replaced by O, S or NR<sub>6</sub>, where R<sub>6</sub> represents hydrogen or a hydrocarbyl group or a substituted hydrocarbyl group; or, if appropriate, an E/Z isomer  
15 and/or tautomer of the compound of formula (I), in each case in free form or in salt form.

2. A process for preparing a compound of formula (I)



wherein  $R_1$ ,  $R_2$ ,  $R_3$ ,  $R_4$ , the bond between the carbon atoms 22 and 23 and  $m$  are as defined in claim 1, comprising the steps of:

5 (i) synthesizing a compound of formula  $(\alpha)$



wherein  $R_1$ , the bond between the carbon atoms 22 and 23 and  $m$  are as defined for formula (I) in claim 1 and  $Q$  is a protecting group;

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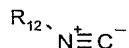
(ii) reacting a disulfide, an aliphatic or aromatic phosphine and a compound of formula ( $\alpha$ ) to yield a sulfenimine derivative of the compound of formula ( $\alpha$ );

(iii) oxidising the sulfenimine derivative of the compound of formula ( $\alpha$ ) to yield a sulfinimine derivative of the compound of formula ( $\alpha$ );

5 either

(iva) reacting an organometallic reagent having the  $R_2$  group with the sulfinimine derivative of the compound of formula ( $\alpha$ ) to yield a desoxy -sulfinamide - hydrocarbyl derivative of the compound of formula ( $\alpha$ ); or

10 (ivb) reacting an isocyanate reagent of formula



where  $R_{12}$  is unsubstituted or mono- to pentasubstituted  $C_1$ - $C_{12}$ alkyl, unsubstituted or mono- to pentasubstituted  $C_3$ - $C_{12}$ cycloalkyl, unsubstituted or mono- to pentasubstituted

$C_2$ - $C_{12}$ alkenyl, unsubstituted or mono- to pentasubstituted  $C_2$ - $C_{12}$ alkynyl, unsubstituted or

15 mono- to pentasubstituted aryl, unsubstituted or mono- to pentasubstituted benzyl

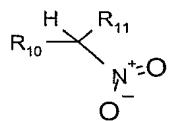
unsubstituted or mono- to pentasubstituted  $C_3$ - $C_{12}$ cycloalkyl ester, unsubstituted or mono-

to pentasubstituted  $C_1$ - $C_{12}$ alkyl ester, unsubstituted or mono- to pentasubstituted

$C_1$ - $C_{12}$ alkyl sulfone or unsubstituted or mono- to pentasubstituted  $C_1$ - $C_{12}$ alkyl nitrile with the sulfinimine derivative of the compound of formula ( $\alpha$ ) to yield a desoxy - amine -

20 hydrocarbyl derivative of the compound of formula ( $\alpha$ ); or

(ivc) reacting an nitro alkyl reagent of formula



where  $R_{10}$  and  $R_{11}$  are independently of each other, H, CN, unsubstituted or mono- to pentasubstituted  $C_1$ - $C_{12}$ alkyl, unsubstituted or mono- to pentasubstituted  $C_3$ - $C_{12}$ cycloalkyl,

25 unsubstituted or mono- to pentasubstituted  $C_2$ - $C_{12}$ alkenyl, unsubstituted or mono- to

pentasubstituted  $C_2$ - $C_{12}$ alkynyl, unsubstituted or mono- to pentasubstituted aryl, unsubstituted or mono- to pentasubstituted benzyl, unsubstituted or mono- to pentasubstituted  $C_3$ - $C_{12}$ cycloalkyl ester, an unsubstituted or mono- to pentasubstituted  $C_1$ - $C_{12}$ alkyl ester, unsubstituted or mono- to pentasubstituted  $C_1$ - $C_{12}$ alkyl sulfone or

5 unsubstituted or mono- to pentasubstituted  $C_1$ - $C_{12}$ alkyl nitrile with the sulfinimine derivative of the compound of formula ( $\alpha$ ) to yield a desoxy - amine - hydrocarbyl derivative of the compound of formula ( $\alpha$ ); and

either

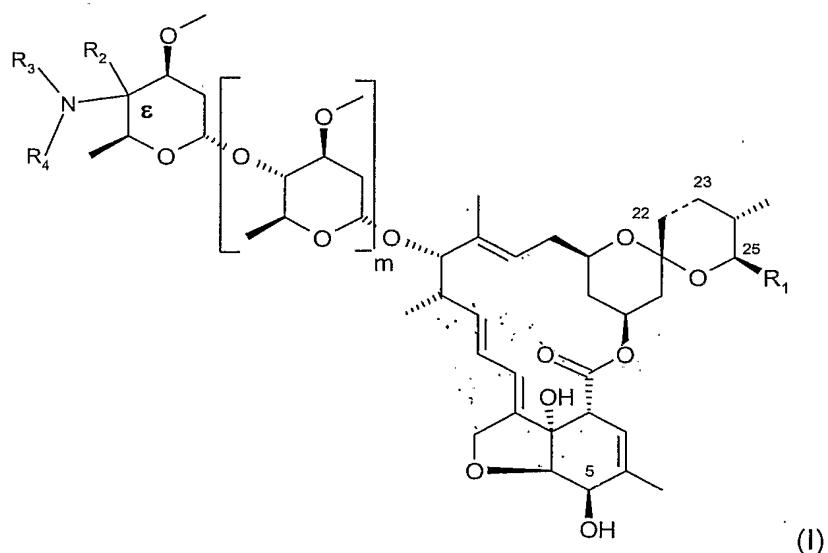
(va) removing the sulfinyl group and protecting group Q either in one step or sequentially

10 one after another to yield a compound of formula (I), where  $R_3$  and  $R_4$  each represent hydrogen, or

(vb) removing the sulfinyl group alone, carrying out reactions on one or more of the  $R_2$ ,  $R_3$  and  $R_4$  groups to modify the group and then removing the protecting group Q to yield a compound of formula (I), or

15 (vc) removing the protecting group Q if the sulfinyl group is removed during (iva) or (ivb) or (ivc) to yield a compound of formula (I).

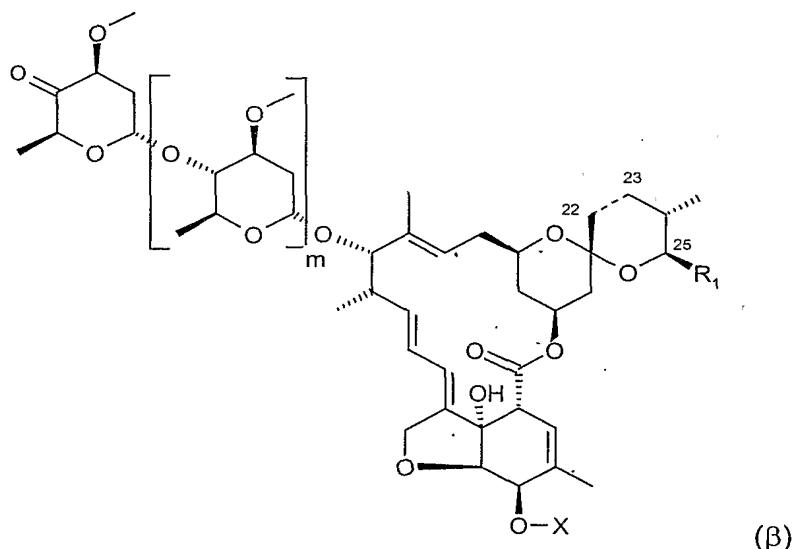
3. A process for preparing a compound of formula (I)



wherein  $R_1$ ,  $R_2$ ,  $R_3$ ,  $R_4$ , the bond between the carbon atoms 22 and 23 and  $m$  are as defined in claim 1, comprising the steps of:

5

(i) synthesizing a compound of formula (β)



wherein R<sub>1</sub>, the bond between the carbon atoms 22 and 23 and m is as defined for formula (I) in claim 1 and X is H or Q, where Q is a protecting group;

10

(ii) reacting N-R<sub>4</sub>hydroxylamine or salt thereof with a compound of formula (β) to yield a nitrone derivative of the compound of formula (β);

either

15 (iii) reacting an organometallic or a silyl reagent having the  $R_2$  group with nitrone derivative of the compound of formula (β) to yield a desoxy - N- $R_4$ hydroxylamino - hydrocarbyl

derivative of the compound of formula (β), where  $R_4$  is as defined for formula (I) in claim 1, or

(iii) reacting an alkene or an alkyne derivative with the nitrone derivative of the compound of formula (β) to yield a desoxy – N-isoazolidine derivative or 2,3-dihydro-isoazole

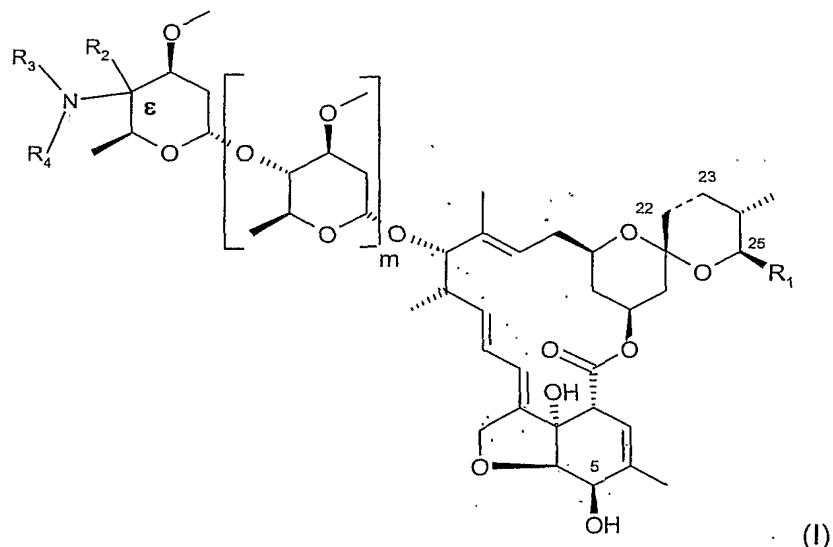
5 derivative respectively of the compound of formula (β); and

either

(iva) removing the protecting group Q, if present, to yield a compound of formula (I), where R<sub>3</sub> is OH in the event of reaction step (iiia), or where R<sub>2</sub> and R<sub>3</sub> is an alkylene or alkenylene bridge with a CH<sub>2</sub> group replaced by an oxygen atom in the event of reaction step (iiib), or

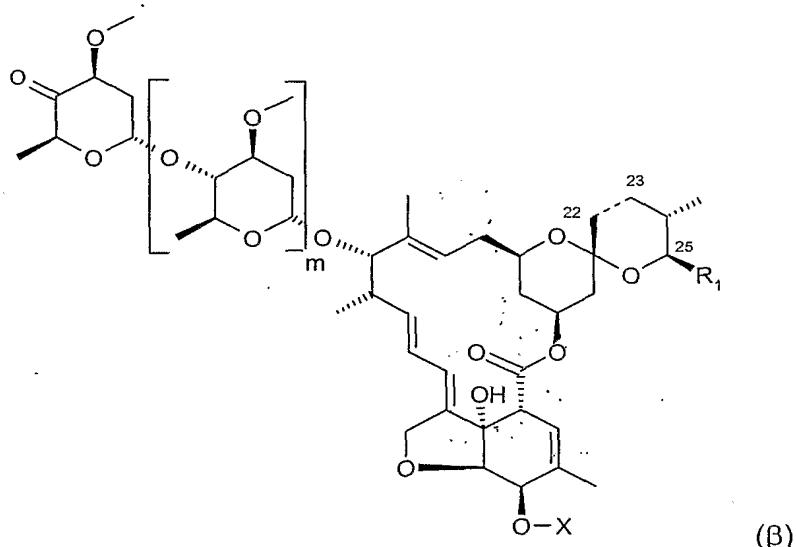
(ivb) carrying out reactions on one or more of  $R_2$ ,  $R_3$  and  $R_4$  groups to modify the group and removing the protecting group Q, if present, to yield a compound of formula (I).

4. A process for preparing a compound of formula (I)



wherein R<sub>1</sub>, R<sub>3</sub>, R<sub>4</sub>, the bond between the carbon atoms 22 and 23 and m are as defined in claim 1 and R<sub>2</sub> is CN, comprising the steps of:

(i) synthesizing a compound of formula (β)



wherein R<sub>1</sub>, the bond between the carbon atoms 22 and 23 and m is as defined in for

5 formula (I) in claim 1 and X is H or Q, where Q is a protecting group;

either

(iia) reacting the compound of formula (β) with a silylated amine (having the R<sub>3</sub> and R<sub>4</sub> groups) in presence of a Lewis acid and a trialkylsilyl cyanide, to yield a compound of

10 formula (I) with the proviso that the oxygen atom at the 5-carbon position is protected, if Q is present, and wherein R<sub>1</sub>, R<sub>3</sub>, R<sub>4</sub>, the bond between the carbon atoms 22 and 23 and m are as defined in claim 1, and R<sub>2</sub> is CN, or

(iib) reacting the compound of formula (β) with an amine of formula R<sub>3</sub>R<sub>4</sub>NH, a chlorosilane, a Lewis acid and a trialkylsilyl cyanide to yield a compound of formula (I) with the proviso

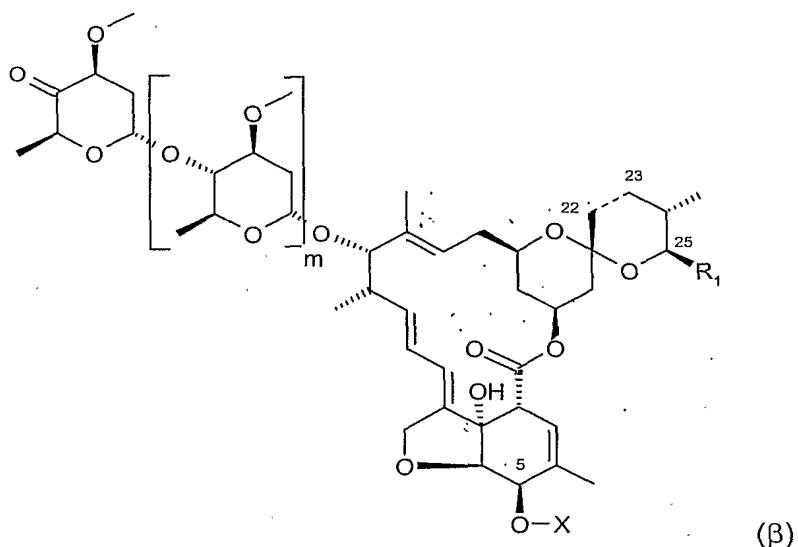
15 that the oxygen atom at the 5-carbon position is protected, if Q is present, and wherein R<sub>1</sub>, R<sub>3</sub>, R<sub>4</sub>, the bond between the carbon atoms 22 and 23 and m are as defined in claim 1, and R<sub>2</sub> is CN;

(iii) optionally carrying out reactions on one or both of  $R_3$  and  $R_4$  groups to modify the group; and

(iv) removing the protecting group Q, if present, to yield a compound of formula (I);

5 or

(i) synthesizing a compound of formula (β)



wherein  $R_1$ , the bond between the carbon atoms 22 and 23 and  $m$  are as defined for formula (I) in claim 1 and  $X$  is H or Q, where Q is a protecting group;

10

(ii) reacting the compound of formula (β) with an ammonium salt of formula  $R_{18}CO_2^-NH_4^+$ , an isocyanide of formula  $R_{12}NC$  to yield a compound of formula (I), with the proviso that the oxygen atom at the 5-carbon position is protected, if Q is present in the compound of formula (β), wherein  $R_1$ , the bond between the carbon atoms 22 and 23 and m are as defined in claim 1,  $R_2$  is  $R_{12}NHC(O)$ , and  $R_4$  is  $R_{18}C(O)$ ,  $R_{18}$  is H, unsubstituted or mono- to pentasubstituted  $C_1$ - $C_{12}$ alkyl, unsubstituted or mono- to pentasubstituted  $C_3$ - $C_{12}$ cycloalkyl, unsubstituted or mono- to pentasubstituted  $C_2$ - $C_{12}$ alkenyl, unsubstituted or mono- to pentasubstituted  $C_2$ - $C_{12}$ alkynyl, unsubstituted or mono- to pentasubstituted aryl, unsubstituted or mono- to pentasubstituted benzyl, unsubstituted or mono- to

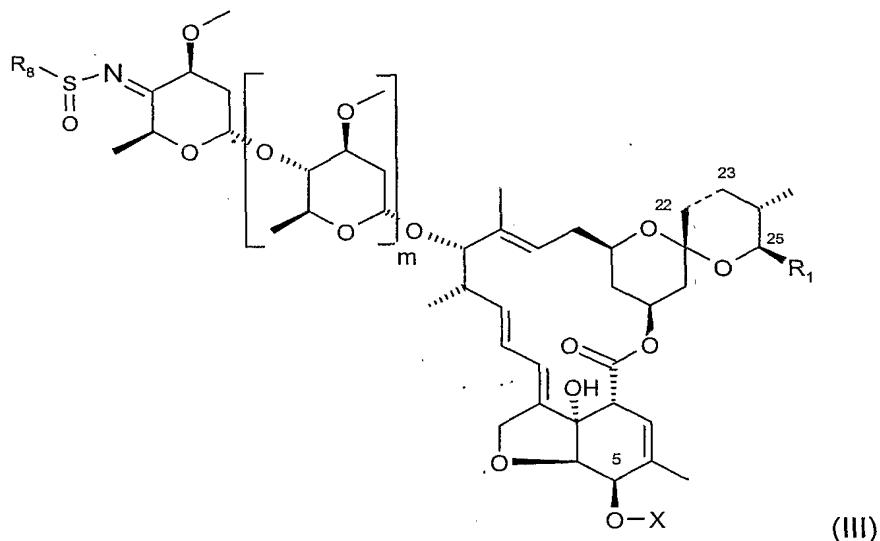
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pentasubstituted  $C_3$ - $C_{12}$ cycloalkyl ester, unsubstituted or mono- to pentasubstituted  $C_1$ - $C_{12}$ alkyl ester, unsubstituted or mono- to penta-substituted  $C_1$ - $C_{12}$ alkyl sulfone or unsubstituted or mono- to pentasubstituted  $C_1$ - $C_{12}$ alkyl nitrile and  $R_{12}$  is as defined in claim 2; and

5

(iii) removing the protecting group Q, if present, to yield a compound of formula (I).

5. A compound of the formula (III)



wherein the bond between carbon atoms 22 and 23 indicated with a broken line is a single  
10 or double bond,

$m$  is 0 or 1,

$R_1$  represents a  $C_1$ - $C_{12}$ alkyl,  $C_3$ - $C_8$ cycloalkyl or  $C_2$ - $C_{12}$ alkenyl, group,

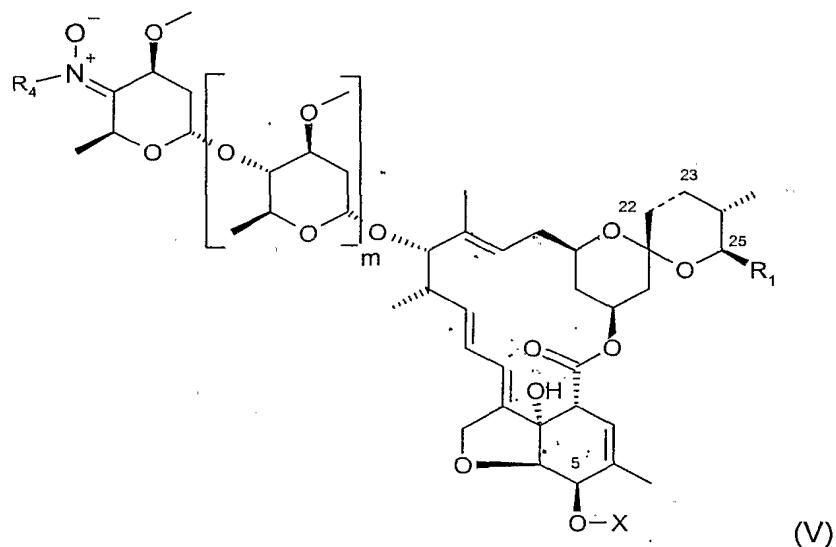
$R_8$  represents  $C_1$ - $C_6$ alkyl that is optionally substituted with one to five substituents  
15 selected from the group consisting of halogen,  $C_1$ - $C_6$ alkoxy, hydroxy, cyano, aryl,  
benzyl or heteroaryl, which, depending on the possibilities of substitution on the  
ring, are mono- to trisubstituted by substituents selected from the group consisting  
of OH, halogen, CN,  $NO_2$ ,  $C_1$ - $C_{12}$ alkyl,  $C_1$ - $C_{12}$ haloalkyl,  $C_1$ - $C_{12}$ alkoxy,  
 $C_1$ - $C_{12}$ haloalkoxy,  $C_1$ - $C_{12}$ alkylthio and  $C_1$ - $C_{12}$ haloalkylthio, and

X represents H or Q, where Q is a suitable protecting group to prevent reaction on the oxygen atom at the 5-carbon position;

or, if appropriate, an E/Z isomer and/or diastereoisomer and/or tautomer of the compound of formula (III), in each case in free form or in salt form.

5

6. A compound of the formula (V)



wherein the bond between carbon atoms 22 and 23 indicated with a broken line is a single or double bond,

10 m is 0 or 1,

R<sub>1</sub> represents a C<sub>1</sub>-C<sub>12</sub>alkyl, C<sub>3</sub>-C<sub>8</sub>cycloalkyl or C<sub>2</sub>-C<sub>12</sub>alkenyl, group,

R<sub>4</sub> represents a chemical constituent, and

X represents H or Q, where Q is a suitable protecting group to prevent reaction on the oxygen atom at the 5-carbon position; or, if appropriate, an E/Z isomer and/or

15 diastereoisomer and/or tautomer of the compound of formula (V), in each case in free form or in salt form.

7. A pesticidal composition comprising at least one compound of the formula (I), (III) or (V), as defined in claim 1, 5 or 6 respectively, as active compound, and at least one auxiliary.

5 8. A method for controlling pests comprising applying a composition defined claim 7 to the pests or their habitat.

9. A process for preparing a composition defined in claim 7 comprising mixing intimately and/ or grinding at least one compound least one compound of the formula (I), (III) or (V),  
10 as defined in claim1, 5 or 6 respectively, as active compound, with at least one auxiliary.

10. The use of a compound of the formula (I), (III) or (V), as defined in claim 1, 5 or 6 respectively, for preparing a composition as defined in claim 7.

15 11. The use of a composition as defined in claim 7 for controlling pests.

12. A method for protecting plant propagation material comprising treating the propagation material, or the location where the propagation material is planted, with a composition defined in claim 7.

20 13. A pest resistant plant propagation material having adhered thereto at least one compound of the formula (I), (III) or (V), as defined in claim 1, 5 or 6 respectively; preferably treated by the method of claim 12.

25 14. The use of compound defined in claim 5 or 6 for preparing a compound of formula (I) as defined in claim 1.